

Technical Report 5-20624 & 5-20625
Contract No. DAAH01-98-D-R001
Delivery Order No. 48

**RESEARCH, EVALUATION AND ANALYSIS OF
DESIGN CHANGES TO THE MLRS LAUNCHER AND CARRIER
(5-20624 & 5-20625)**

Final Technical Report for Period
28 May 1999 through 30 September 1999

October 1999

Prepared by:

Gary A. Maddux

Research Institute
The University of Alabama in Huntsville
Huntsville, Alabama 35899

Prepared for:

U.S. Army Aviation and Missile Command
Redstone Arsenal, AL 35898
Attn.: Mr. Andrew Mullins

20000309 098

REPORT DOCUMENTATION PAGE

Form Approved

OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Service, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE October 99	3. REPORT TYPE AND DATES COVERED Final Report: 28 MAY 99 thru 30 SEP 99	
4. TITLE AND SUBTITLE RESEARCH, EVALUATION AND ANALYSIS OF DESIGN CHANGES TO THE MLRS LAUNCHER AND CARRIER			5. FUNDING NUMBERS	
6. AUTHOR(S) Gary A. Maddux				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Univ. of Alabama in Huntsville Huntsville, AL 35899			8. PERFORMING ORGANIZATION REPORT NUMBER 5-20624 & 5-20625	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) AMSAM-RD-SE-MT (A. MULLINS) U.S. Army Aviation & Missile Command Redstone Arsenal, AL 35898			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for Public Release; Distribution is unlimited.			12b. DISTRIBUTION CODE A	
13. ABSTRACT (Maximum 200 words) The System Engineering and Production Directorate (SEPD), Research Development and Engineering Center (RDEC), U.S. Army Aviation and Missile Command (AMCOM) has an engineering support contract with the University of Alabama in Huntsville. The scope of the contract provides for activities in system engineering and manufacturing technology. The Industrial Operations Division (IOD), SEPD, RDEC, AMCOM has the mission and function of providing technical management and engineering analysis as they relate to design changes for AMCOM supported weapon systems. This management and analysis ensures that design changes are incorporated only after a systematic technical evaluation and review of the total cost of the change is conducted. The systems engineering analysis evaluates the long-term life cycle consequences of the change, to include impacts on the manufacturability, maintainability and supportability of the overall weapon system.				
14. SUBJECT TERMS MLRS design changes			15. NUMBER OF PAGES 2	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	

PLEASE CHECK THE APPROPRIATE BLOCK BELOW

DAO# _____

☐ _____ copies are being forwarded. Indicate whether Statement A, B, C, D, E, F, or X applies.

☒ DISTRIBUTION STATEMENT A:
APPROVED FOR PUBLIC RELEASE: DISTRIBUTION IS UNLIMITED

☐ DISTRIBUTION STATEMENT B:
DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES
ONLY; (indicate Reason and Date). OTHER REQUESTS FOR THIS
DOCUMENT SHALL BE REFERRED TO (Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT C:
DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES AND
THEIR CONTRACTS (Indicate Reason and Date). OTHER REQUESTS
FOR THIS DOCUMENT SHALL BE REFERRED TO (Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT D:
DISTRIBUTION AUTHORIZED TO DoD AND U.S. DoD CONTRACTORS
ONLY; (Indicate Reason and Date). OTHER REQUESTS SHALL BE REFERRED TO
(Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT E:
DISTRIBUTION AUTHORIZED TO DoD COMPONENTS ONLY; (Indicate
Reason and Date). OTHER REQUESTS SHALL BE REFERRED TO (Indicate Controlling DoD Office).

☐ DISTRIBUTION STATEMENT F:
FUTHER DISSEMINATION ONLY AS DIRECTED BY (Indicate Controlling DoD Office
and Date) or HIGHER DoD AUTHORITY.

☐ DISTRIBUTION STATEMENT X:
DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES
AND PRIVATE INDIVIDUALS OR ENTERPRISES ELIGIBLE TO OBTAIN EXPORT-CONTROLLED
TECHNICAL DATA IN ACCORDANCE WITH DoD DIRECTIVE 5230.25. WITHHOLDING OF
UNCLASSIFIED TECHNICAL DATA FROM PUBLIC DISCLOSURE, 6 Nov 1984 (indicate date of
determination). CONTROLLING DoD OFFICE IS (Indicate Controlling DoD Office).

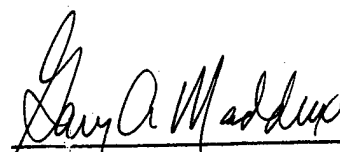
☐ This document was previously forwarded to DTIC on _____ (date) and the
AD number is _____.

☐ In accordance with provisions of DoD instructions. The document requested is not supplied because:

☐ It will be published at a later date. (Enter approximate date, if known).

☐ Other. (Give Reason)

DoD Directive 5230.24, "Distribution Statements on Technical Documents," 18 Mar 87, contains seven distribution statements, as described briefly above. Technical Documents must be assigned distribution statements.


Authorized Signature/Date

GARY A. MADDUX

Print or Type Name

256 890 6343 x223

Telephone Number

PREFACE

This technical report was prepared by the staff of the Research Institute, The University of Alabama in Huntsville. The purpose of this report is to provide documentation of the work performed and results obtained under Delivery Order 48 of AMCOM Contract No. DAAH01-98-D-R001. Mr. Gary A. Maddux was the principal investigator. Mr. Bert Jones served as the lead engineer on the effort. Mr. Andrew Mullins, Systems Engineering and Production Directorate, Research, Development and Engineering Center, provided technical guidance.

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other official documentation.

Except as provided by the Contract Data Requirements List DD Form 1423, hereof, the distribution of any contract report in any state of development or completion is prohibited without the approval of the Contracting Officer.

Prepared for: Commander
U.S. Army Missile Command
Redstone Arsenal, AL 35898

I have reviewed this report, dated October 1999 and the report contains no classified information.

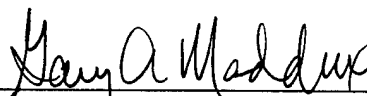

Principal Investigator

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	OBJECTIVES	1
3.0	STATEMENT OF WORK	1
4.0	CONCLUSIONS AND RECOMMENDATIONS	2

1.0 Introduction

The System Engineering and Production Directorate (SEPD), Research Development and Engineering Center (RDEC), U.S. Army Aviation and Missile Command (AMCOM) has an engineering support contract with the University of Alabama in Huntsville. The scope of the contract provides for activities in system engineering and manufacturing technology. The Industrial Operations Division (IOD), SEPD, RDEC, AMCOM has the mission and function of providing technical management and engineering analysis as they relate to design changes for AMCOM supported weapon systems. This management and analysis ensures that design changes are incorporated only after a systematic technical evaluation and review of the total cost of the change is conducted. The systems engineering analysis evaluates the long-term life cycle consequences of the change, to include impacts on the manufacturability, maintainability and supportability of the overall weapon system.

In order to fulfill its mission, IOD required research, analysis and evaluation of proposed changes to the Multiple Launch Rocket System (MLRS) launcher and carrier. This research effort concluded with a detailed analysis of the impacts of proposed changes on the current manufacturing processes and life-cycle support activities that were currently in place within the MLRS Project Office.

2.0 Objective

The objective of the work performed under this task order was to research, evaluate, analyze and develop recommendations as to the impacts of current proposed design changes to the MLRS launcher and carrier. These recommended design solutions required close interaction with the MLRS Project Office, their prime and sub-contractors, and other Government agencies. The solutions were presented to the MLRS Project Office and the IOD in the form of briefings and other detailed presentations as required by the project office.

3.0 Statement of Work

The statement of work, as outlined in delivery order 48, was as follows:

- 3.1 UAH shall provide engineering and technical expertise to evaluate and provide solution options related to spare parts procurement problems.
- 3.2 UAH shall analyze the producibility of the MLRS weapon System and subsystems. The analyses shall be performed on parts specifically identified by the government. UAH shall analyze TDP data (listings, engineering documentation and changes thereto) to advise the government if the present baseline and/or detail drawings are adequate for competitive procurement and/or manufacture. UAH shall, during TDP analyses, document any cost reduction opportunities in the TDP, using generally accepted value engineering

methodology. UAH shall provide a written report for each TDP analyzed. UAH shall provide recommended TDP updates where applicable.

- 3.3 UAH shall perform systems engineering analysis on producibility problems identified during the procurement cycle of MLRS secondary items. The analysis shall require a review of drawings, specifications, and related materials pertaining to the identified problem. UAH shall determine and recommend solutions to the producibility problem(s) and provide rationale to support recommendations. UAH shall, during engineering analysis, document any cost reduction opportunities in the TDP, using generally accepted value engineering methodology. Results of the analysis shall be prepared and furnished in a written report.

4.0 Conclusion and Recommendations

During the time frame allocated by the delivery order, members of the UAH Systems Management and Production Lab, with the cooperation of representatives from AMCOM Systems Engineering and Production Directorate and the MLRS Project Office, investigated the life cycle supportability of proposed changes to the MLRS launcher and carrier. Specifically, TDP data was examined for completeness and accuracy in its use for competitive procurement and manufacture. To ascertain this information, UAH worked with the MLRS project offices, its prime and sub-contractors, and other government agencies. The results of these task efforts were published and delivered to IOD under separate cover.